NODE=M246

$B_J(5840)$

$I(J^P) = \frac{1}{2}(?^?)$
I, J, P need confirmation.

OMITTED FROM SUMMARY TABLE

Quantum numbers shown are quark-model predictions.

NODE=M246

$B_J(5840)$ MASS

NODE=M246205

$B_J(5840)^+$ MASS

NODE=M246M+

OUR FIT uses m_{B^0} and $m_{B_J(5840)^+} - m_{B^0}$ to determine $m_{B_J(5840)^+}$.

NODE=M246M+

VALUE (MeV)	DOCUMENT ID
5851±19 OUR FIT	

NODE=M246M+

$m_{B_J(5840)^+} - m_{B^0}$

NODE=M246DM+

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
571±19 OUR FIT				
571±13±14	7k	[1] AAIJ	15AB LHCB	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
595±26±14	7k	[2] AAIJ	15AB LHCB	pp at 7, 8 TeV

NODE=M246DM+

OCCUR=2

[1] AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 431 \pm 13 \pm 14$ MeV which we adjust by the π^+ mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = (-1)^J$ and uses two relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246DM+;LINKAGE=A

[2] AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 455 \pm 26 \pm 14$ MeV which we adjust by the π^+ mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = (-1)^J$ and uses three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246DM+;LINKAGE=B

$m_{B_J(5840)^+} - m_{B^{*0}}$

NODE=M246DM1

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
565±15±14	7k	[1] AAIJ	15AB LHCB	pp at 7, 8 TeV

NODE=M246DM1

[1] AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^+} = 425 \pm 15 \pm 14$ MeV which we adjust by the π^+ mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = -(-1)^J$, $(m_{B^{*0}} - m_{B^0}) = (m_{B^{*+}} - m_{B^+}) = 45.01 \pm 0.30 \pm 0.23$ MeV, and uses three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246DM1;LINKAGE=A

$B_J(5840)^0$ MASS

NODE=M246M0

OUR FIT uses m_{B^+} and $m_{B_J(5840)^0} - m_{B^+}$ to determine $m_{B_J(5840)^0}$.

NODE=M246M0

VALUE (MeV)	DOCUMENT ID
5863±9 OUR FIT	

NODE=M246M0

$m_{B_J(5840)^0} - m_{B^+}$

NODE=M246DM0

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
584± 9 OUR FIT				
584± 5±7	12k	[1] AAIJ	15AB LHCB	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
610±22±7	12k	[2] AAIJ	15AB LHCB	pp at 7, 8 TeV

NODE=M246DM0

OCCUR=2

[1] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - m_{\pi^-} = 444 \pm 5 \pm 7$ MeV which we adjust by the π^- mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = (-1)^J$ and uses two relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246DM0;LINKAGE=A

[2] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - m_{\pi^-} = 471 \pm 22 \pm 7$ MeV which we adjust by the π^- mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = (-1)^J$ and uses three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246DM0;LINKAGE=B

$m_{B_J(5840)^0} - m_{B^{*+}}$

NODE=M246DM2
NODE=M246DM2

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
584±5±7	12k	[1] AAIJ	15AB	LHCB	pp at 7, 8 TeV

[1] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^-} = 444 \pm 5 \pm 7$ MeV which we adjust by the π^- mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = -(-1)^J$, $(m_{B^{*+}} - m_{B^+}) = 45.01 \pm 0.30 \pm 0.23$ MeV, and uses three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246DM2;LINKAGE=A

$B_J(5840)$ WIDTH

NODE=M246210

$B_J(5840)^+$ WIDTH

NODE=M246W+
NODE=M246W+

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
224±24±80	7k	[1] AAIJ	15AB	LHCB	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
215±27±80	7k	[2] AAIJ	15AB	LHCB	pp at 7, 8 TeV
229±27±80	7k	[3] AAIJ	15AB	LHCB	pp at 7, 8 TeV

OCCUR=2
OCCUR=3

[1] Assuming $P = (-1)^J$ and using two relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246W+;LINKAGE=A

[2] Assuming $P = (-1)^J$ and using three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246W+;LINKAGE=B

[3] Assuming $P = -(-1)^J$ and using three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246W+;LINKAGE=C

$B_J(5840)^0$ WIDTH

NODE=M246W0
NODE=M246W0

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
127±17±34	12k	[1] AAIJ	15AB	LHCB	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
107±20±34	12k	[2] AAIJ	15AB	LHCB	pp at 7, 8 TeV
119±17±34	12k	[3] AAIJ	15AB	LHCB	pp at 7, 8 TeV

OCCUR=2
OCCUR=3

[1] Assuming $P = (-1)^J$ and using two relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246W0;LINKAGE=A

[2] Assuming $P = (-1)^J$ and using three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246W0;LINKAGE=B

[3] Assuming $P = -(-1)^J$ and using three relativistic Breit-Wigner functions in the fit for mass difference.

NODE=M246W0;LINKAGE=C

$B_J(5840)$ DECAY MODES

NODE=M246215;NODE=M246

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$B^*\pi$	seen	DESIG=1
Γ_2	$B\pi$	possibly seen	DESIG=2

$B_J(5840)$ BRANCHING RATIOS

NODE=M246220

$\Gamma(B^*\pi)/\Gamma_{total}$ Γ_1/Γ

NODE=M246R01
NODE=M246R01

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
seen	7k	AAIJ	15AB	LHCB	±	pp at 7, 8 TeV
seen	12k	AAIJ	15AB	LHCB	0	pp at 7, 8 TeV

OCCUR=2

$\Gamma(B\pi)/\Gamma_{total}$ Γ_2/Γ

NODE=M246R02
NODE=M246R02

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
possibly seen	7k	[1] AAIJ	15AB	LHCB	±	pp at 7, 8 TeV
possibly seen		[1] AAIJ	15AB	LHCB	0	pp at 7, 8 TeV

OCCUR=2

[1] A $B\pi$ decay is forbidden from a $P = -(-1)^J$ parent, whereas $B^*\pi$ is allowed.

NODE=M246R02;LINKAGE=A

$B_J(5840)$ REFERENCES

NODE=M246

AAIJ 15AB JHEP 1504 024 R. Aaij *et al.* (LHCb Collab.)

REFID=56628